IS 10558 (1983): Aluminium Shore Gangways [TED 17: Shipbuilding]

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Indian Standard

SPECIFICATION FOR ALUMINIUM SHORE GANGWAYS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR ALUMINIUM SHORE GANGWAYS

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Indian Standard

SPECIFICATION FOR ALUMINIUM SHORE GANGWAYS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 March 1983, after the draft finalized by the Shipbuilding Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 Ships require a means of ship-to-shore access which can be safely used by all persons. The aluminium shore gangway provides a lightweight convenient structure which can be used in a horizontal or inclined position up to an angle of 30° from the horizontal dependent on tidal or freeboard conditions. Special designs of step allow for a more severe angle to be employed than the 30° specified. The gangways described in this standard are not intended to carry wheeled traffic, such as, loaded trolleys, etc.

0.3 Type ' C ' gangway described in this standard is meant to be used for " first person ashore ".

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard specifies requirements for three types of aluminium ship-to-shore gangways which are for the use of persons only to embark or disembark safely.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Gangway — A bridge structure to allow safe embarkation and disembarkation from ship to shore or access to another ship.

*Rules for rounding off numerical values (*revised*).

2.2 Side Stringers — The longitudinal strength members of the gangway to which the cross-members, stanchions, roller or wheels, the lifting lugs, etc, are attached.

2.3 Cross-Members — The bars, angles or hollow sections which hold the side stringers in position, and provide support for the decking.

2.4 Decking — Flat topped corrugated section or plate.

2.5 Footsteps — The bars, rounded hollow sections or hardwood battens fitted proud of the decking or deck plate level to give better foot grip when the gangway is inclined from the horizontal position.

2.6 Hand and Intermediate Guides — The tubes, bars, ropes or chains which protect people from falling from the gangway.

2.7 Nominal Size — The length of the gangway between points of support (*see* Fig. 1, 2 and 3).

3. TYPES OF GANGWAY

3.1 The following three types of gangways are specified in this standard:

a) *Type A* — Rigid-decking two-handrail gangway (*see* Fig. 1);

b) *Type B* — Hinged, two-handrail gangway (*see* Fig. 2);

c) *Type C* — Rigid-narrow-decking, two-handrail gangway (*see* Fig. 3 and Appendix A).

NOTE — The longer Type A gangway with hinged or portable handguides may be made up of sections connected by rigid jointing. For gangways assembled in this way, the preferred number of sections is given in Table 3.

4. MATERIALS

4.1 The materials shall comply with the requirements of Table 1. Other materials may be used provided they have equivalent strength and are compatible with the structural use of aluminium.

5. DIMENSIONS

5.1 Gangways shall be designed to the nominal sizes shown in Tables 2 and 3 for Types A and B, and Tables 4 and 5 for Type C.

5.2 The minimum width between side stringers shall be as indicated in Fig. 1, 2 and 3.

6. DESIGN AND CONSTRUCTION

6.1 Design

6.1.1 The manufacturer of the gangway shall be informed of any unusual or hazardous conditions affecting the design of the gangway.

TABLE 1 MATERIAL

(*Clause* 4.1)

Component	Material	Relevent Indian Standard	Remarks
(1)	(2)	(3)	(4)
Side stringers	Aluminium	IS : 733[1], IS : 736[2], IS : 737[3], IS : 740[4], IS : 1284[5], IS : 1285[6]	H 30 alloy
Cross-members	Aluminium	IS : 736[2], IS : 737[3], IS : 1285[6]	do
Decking or deck plates	Aluminium	do	do
Footsteps	Aluminium, Hardwood	IS : 1285[6]	do
Rollers or Wheels	Carbon steel, Carbon steel with solid types	IS : 2062[7]	Grade 43A Ribbed or Flat tread
Stanchions	Aluminium Carbon steel	IS : 733[1], IS : 1285[6] IS : 2062[7]	H 30 alloy Grade 43A
Handguides:			
Handrail	Aluminium section	IS : 1285[6]	*See* **6.2.6**
Handrope	Sisal or manila Polypropylene	IS : 1321[8] or IS : 1084[9] IS : 5175[10]	*See* Note to **6.2.6**
Handchain	Steel	IS : 3109 (Part I)[11]	Galvanized
Handwire, Plastic coated	PVC coated Guard-wire rope		
Securing device	Sisal or manila Polypropylene Polypropylene staple fibre	IS : 1321[8] or IS : 1084[9] IS : 5175[10]	 *See* Note to **6.2.6**
Toeboards	Aluminium, hardwood	IS : 733[1]	H 30 alloy

NOTE — The reference numbers in this table refer to parts of Fig. 1, 2 and 3.

[1]Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (*second revision*).

[2]Specification for wrought aluminium and aluminium alloys, plates (for general engineering purposes).

[3]Specification for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes).

[4]Specification for wrought aluminium and aluminium alloy rivet stock for general engineering purposes.

[5]Specification for wrought aluminium alloy, bolt and screw stock (for general engineering purposes).

[6]Specification for wrought aluminium and aluminium alloy, extruded round tube and hollow section (for general engineering purposes).

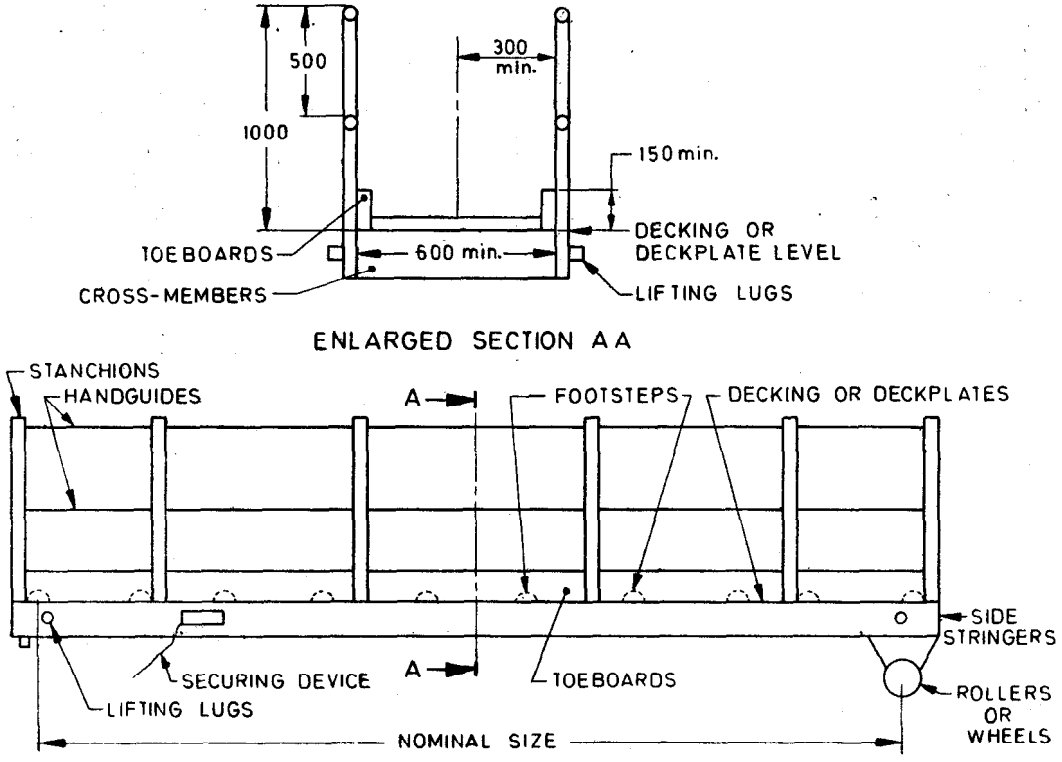
[7]Specification for structural steel (fusion welding quality) (*first revision*).

[8]Specification for sisal rope (*first revision*).

[9]Specification for manila rope (*second revision*).

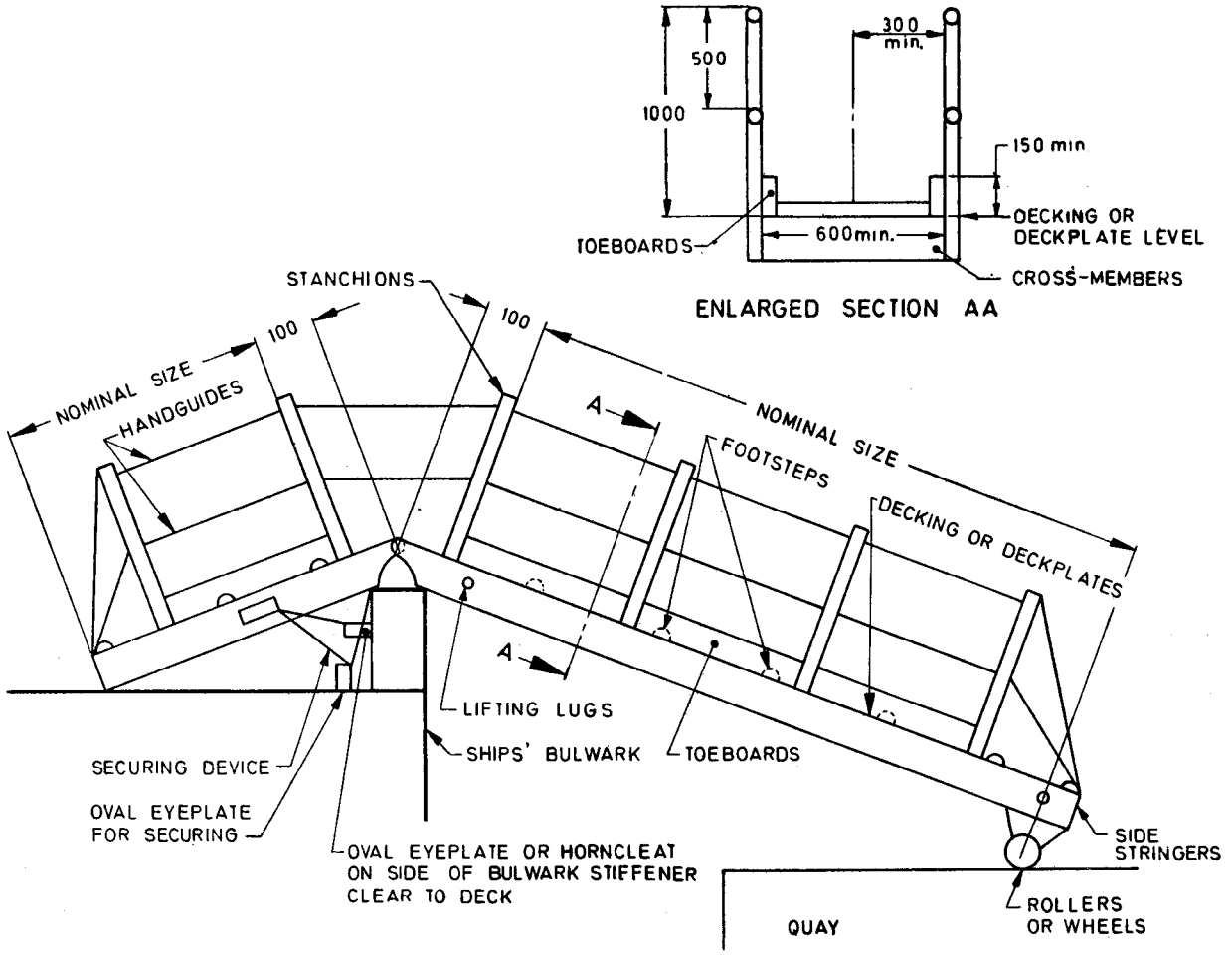
[10]Specification for polypropylene lines and ropes for marine purposes.

[11]Specification for non-calibrated load chain for lifting purposes (*first revision*).



All dimensions in millimetres.

FIG. 1 GENERAL ARRANGEMENT OF TYPE A GANGWAY



NOTE — Height of the bulwark end stanchions to give minimum height to handguide of 1 000 mm.

All dimensions in millimetres.

FIG. 2 GENERAL ARRANGEMENT OF TYPE B GANGWAY

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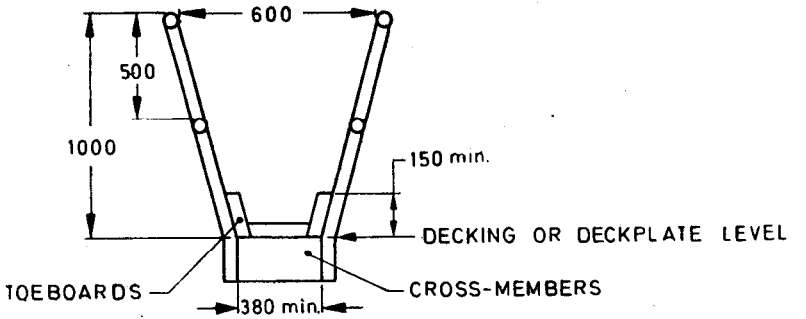
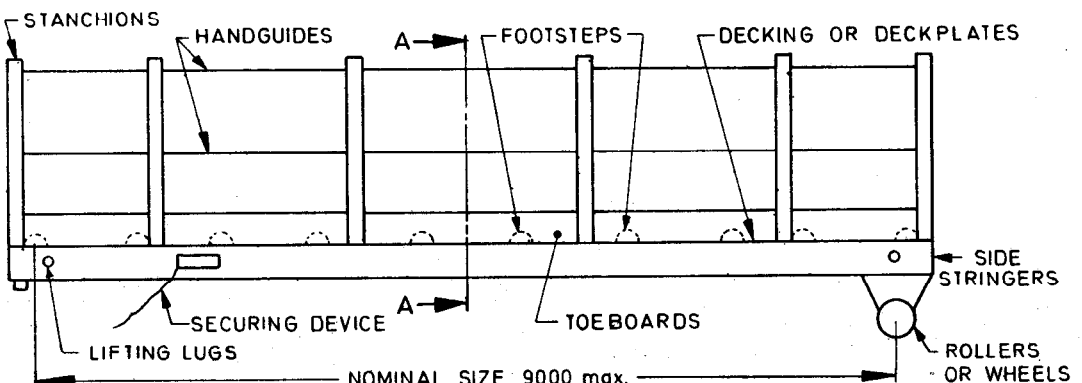


ENLARGED SECTION A A



All dimensions in millimetres.

FIG. 3 GENERAL ARRANGEMENT OF TYPE C GANGWAY

TABLE 2 NOMINAL SIZES AND STOWAGE DIMENSIONS OF TYPES A AND B (FIXED HANDGUIDES)

[*Clauses* 5.1, 13.1(c)]

Nominal Size, mm	Maximum Stowage Dimensions of Uncrated Gangways with Fixed Handguides, mm					
	Maximum Overall Length		Maximum Overall Width		Maximum Depth (Fixed Handguides)	
	Type A	*Type B*	*Type A*	*Type B*	*Type A*	*Type B*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3 000	3 750	3 500	650	650	1 400	Made up from two nominal sizes. Use maximum depth dimensions for type A gangway for relevant sections
4 000	4 750	4 500	650	650	1 400	
5 000	5 750	5 550	650	650	1 500	
7 000	7 750	7 600	650	650	1 500	
9 000	9 750	9 600	650	650	1 500	
12 000	12 750	12 600	800	800	1 600	
15 000	15 750	15 600	800	800	1 750	
18 000	18 750	18 600	800	800	1 900	
21 000	21 750	21 600	800	800	2 050	
24 000	24 750	24 600	800	800	2 200	
27 000	27 750	27 600	800	800	2 400	
30 000	30 750	30 600	800	800	2 600	

6.1.2 The manufacturer shall ensure that:

a) Where dissimilar metals are used in the construction of an aluminium shore gangway their direct contact shall be avoided, to prevent galvanic corrosion. Where aluminium and mild steel have common faying surfaces the mild steel is to be galvanized and the surfaces are to be etched prime with zinc chromate primer and coated with jeffery jointing compound. Connecting nuts, bolts and washers are to be dipped in jeffery jointing compound before being used;

b) Each gangway is provided with an effective and marked earthing device;

c) The gangway is suitably surface coated to prevent incendive sparking; and

d) Antiseize compound is applied to the thread of aluminium alloy bolts before screwing on nuts.

6.1.3 *Design Loading* — The assembly, comprising side stringers, cross-members and decking shall be designed to withstand a uniform deck loading of 4 000 N/m^2, applied to the decking and treads whilst the gangway is in a horizontal position.

6.1.4 *Factor of Safety* — The allowable stress used in the design of the gangway with the loading specified in **6.1.3** shall be determined by applying a factor of safety of 2 on the 0·2 percent proof stress of aluminium.

6.2 Construction

6.2.1 *Side Stringers* — Side stringers shall be constructed from welded, extruded hollow or rolled sections, or from plate or from any combination of these.

6.2.2 *Cross-Members* — Cross-members attached to the side stringers shall be capable of supporting the deck or deck plates.

6.2.3 *Decking* — The decking shall comprise either continuous flat-topped longitudinal corrugated section or individual flat-plate surfaces, which may have a non-slip coating.

6.2.4 *Footsteps* — Footsteps of 50 × 30 mm hardwood shall be secured to the top of the decking at regular centre to centre intervals of not less than 400 mm. Alternatively, the footsteps may be constructed from extruded aluminium sections secured to the stringers of the decking, and raised above decking level by a minimum of 30 mm, in which case the minimum longitudinal length of flat decking between adjacent footsteps shall be 350 mm.

6.2.5 *Stanchions* — Stanchions shall be constructed from carbon steel or aluminium to a height that complies with Fig. 1, 2 and 3. They shall be fitted at regular intervals along the gangway, with a maximum permitted interval of 1500 mm. Stanchions and associated hand guides shall be designed for a side loading at the upper guide level of 500 N/m, without permanent deformation to stanchions or rigid hand guides when used. Stanchions shall be erected vertically with the gangway horizontal and shall be of one of the following types:

a) Fixed;

b) Hinged, with provision made to prevent inadvertant collapse; and

c) Portable, with securement to prevent accidental displacement from the socket or base support.

Galvanized stanchions where specified shall comply with the requirements of IS : 4736-1968*.

6.2.6 *Hand and Intermediate Guides* — Hand and intermediate guides for the gangway shall be provided which comply with Fig. 1, 2 and 3, and shall be of one of the following types:

a) Continuous and adequately tensioned sisal, manila or polypropylene or plastic covered wire-rope of 16 mm minimum diameter.

NOTE — Polypropylene ropes shall be certified effective against actinic degradation for two years exposure in tropical conditions.

*Specification for hot-dip zinc coatings on steel tubes.

b) Galvanized steel chain provided with adequate means of tensioning.

c) Continuous rigid aluminium solid or hollow section for use with fixed or portable stanchions.

d) Continuous rigid aluminium solid or hollow section for the hand-guides of hinged stanchions, with the intermediate guides as in **6.2.6** (a).

6.2.7 *Toeboards* — Toeboards, to a height of at least 150 mm above the decking level, shall be fitted at each side of the gangway.

6.2.8 *Roller or Wheels* — A roller or wheels of 100 mm minimum diameter shall be positioned at one end of the gangway. Rollers or wheels shall be self-lubricated or fitted with a lubricating nipple which complies with the requirements of IS : 4009-1967*, and shall have guards provided for foot protection when the ship moves. The maximum angle of use of the gangway shall not prevent loss of contact between the roller and wheels with the contact surface.

6.2.9 *Securing Devices* — Suitable attachments shall be provided on both sides of the gangway in order to connect the securing devices (*see* Fig. 1, 2 and 3).

6.2.10 *Lifting Lugs* — The gangway shall be provided with four lifting lugs securely attached to the stringers and positioned to produce a balanced lift.

6.2.11 *Angle of Use* — The construction of the gangway shall allow for usage at any angle of inclination from the horizontal plane to 30° from the horizontal.

7. WORKMANSHIP

7.1 The assembly, comprising side stringers, cross-members, and decking, together with all ancillary fittings, shall be visibly free from defects and distortion.

7.2 All components shall be free from exposed rough or sharp edges likely to cause injury.

7.3 Care shall be taken in the preparation, riveting, bolting or welding of aluminium structures to ensure that the permissible design stresses are not exceeded.

7.4 The requirements under **6.1.1** and **6.1.2** shall be verified where applicable.

*Specification for grease nipples.

8. ACCEPTANCE TESTS

8.1 The following tests shall be carried out at the manufacturer's works.

8.2 Manufacturer's Type Test — One gangway of each nominal size and type shall be tested in accordance with Appendix B and a test certificate made available to the purchaser on request.

8.3 Individual Test — Each gangway shall be fully assembled with all fittings comprising the dead load (that is the fully erected gangway) and tested as follows:

a) Lifting by lifting lugs,

b) Measurement of initial sag (*see* Appendix B), and

e) Preparation for stowage and checking of stowage dimensions.

TABLE 3 NOMINAL SIZES AND STOWAGE DIMENSIONS OF TYPES A AND B (HINGED OR PORTABLE HANDGUIDES)

[*Clauses* 5.1, 13.1(c)]

Nominal Size, mm	Maximum Stowage Dimensions of Uncrated Gangways with Hinged or Portable Handguides, mm						
	Maximum Overall Length		Maximum Overall Width		Maximum Depth (Stanchions Removed or Folded Flat)		
	*Type A**	*Type B*	*Type A*	*Type B*	*Type A*		*Type B*
					No. of sections	Depth	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3 000	3 750	3 500	650	650	1	300	Made up from two nominal sizes. Use maximum depth dimensions for type A gangway for relevant sections
4 000	4 750	4 500	650	650		300	
5 000	5 750	5 550	650	650		317	
7 000	7 750	7 600	650	650		350	
9 000	9 750	9 600	650	650		400	
12 000	12 750	12 600	800	800	2	700	
15 000	15 750	15 600	800	800		800	
18 000	18 750	18 600	800	800		900	
21 000	21 750	21 600	800	800	3	1 000	
24 000	24 750	24 600	800	800		1 100	
27 000	27 750	27 600	800	800		1 200	
30 000	30 750	30 600	800	800		1 300	

NOTE — If greater angles of inclination are required, the purchaser shall specify the maximum angle to the manufacturer.

*Stowed lengths may be shorter if rigid-joint extendable gangways are used. The preferred number of sections of Type A gangways assembled in this way is shown in col 8.

9. INSPECTION

9.1 Gangways subjected to a type test shall be inspected to ensure that there are no signs of residual weakness or damage.

9.2 All gangways shall be visually checked to ensure that:

a) there is no distortion of the side stringers;

b) the decking or deck plates are adequately secured;

c) the roller or wheels revolve freely;

d) if applicable, the stanchions, hand and intermediate guides may be easily erected in position;

e) if applicable, any folding sections can be secured without damage;

f) removable fittings for rigid joints are identified and properly stowed when the gangway is dismantled; and

g) rating plate is affixed and correct.

10. DESIGNATION

10.1 The gangway conforming to this Indian Standard shall be designated as follows:

a) Nominal size,

b) Type,

c) Maximum permitted angle of use, and

d) Number of this Indian Standard.

Example:

Designation of an aluminium shore gangway of nominal size 12 000, Type A, limited to 30° angle of use shall be

Aluminium Shore Gangway, 12 000, A, 30°, IS : 10558-1983.

11. MARKING

11.1 Each gangway shall be permanently marked by means of a rating plate prominently displayed. The rating plate shall contain such information as is relevant to the gangway, including the following:

a) Manufacturer's name or trade-mark, type, number and serial number;

b) Number of this Indian Standard;

c) Type of gangway, that is, A, B or C;

d) Nominal size; and

e) Maximum permitted angle of use.

12. PREPARATION FOR DESPATCH

12.1 Gangways shall be prepared for despatch with suitable protection to prevent damage in transit. Loose gear shall be well secured or packed in separate crates or boxes. The gangway shall be clearly marked with the manufacturer's and purchaser's reference number or other identification.

12.2 Any special packing requirements for the gangway shall be specified by the purchaser.

13. INFORMATION TO BE SUPPLIED BY THE PURCHASER

13.1 At the time of the enquiry or order the purchaser shall provide the manufacturer with the following information:

a) Gangway to IS : 10558-1983.

b) Type of gangway (*see* **3**);

c) Nominal size (*see* Tables 2 and 3 and Tables 4 and 5 in Appendix A);

d) For a Type A gangway, statement of preference for number of sections (*see* Note under Table 3);

e) Type of stanchions required (*see* **6.2.5**);

f) Type of hand and intermediate guides required (*see* **6.2.6**);

g) Whether to be fitted with rollers or wheels (*see* **6.2.8**);

h) Desired length of securing devices (*see* **6.2.9**);

j) Angle of inclination, if over 30° (*see* **6.2.11**);

k) Whether a test certificate is required (*see* **8**);

m) If additional tests are to be performed;

n) Any special stowage requirements for gangway fittings; and

p) Any special protection required for despatch (*see* **12.2**).

14. INFORMATION TO BE SUPPLIED BY THE MANUFACTURER

14.1 When specified by the purchaser, the manufacturer shall supply the following information at the tendering stage:

a) Arrangement drawing of gangway with principal dimensions and attachment details, and

b) Mass of gangway.

APPENDIX A

[*Clauses* 0.3, 3.1(c) *and* 13.1(c)]

RIGID NARROW DECKING, TWO HANDRAIL GANGWAY

A-1. These are small lightweight gangways which can be placed into position and may be used for the quick disembarkation of a small number of people when a ship first secures alongside. In this standard these are designated as Type C. Nominal sizes and stowage dimensions are given in Tables 4 and 5 and the general arrangement is shown in Fig. 3.

TABLE 4 NOMINAL SIZES AND STOWAGE DIMENSIONS OF TYPE C (FIXED HANDGUIDES)

[*Clauses* 5.1 *and* 13.1(c)]

Nominal Size, mm	Maximum Stowage Dimensions in mm of Uncrated Gangways with Fixed Handguides		
	Maximum Overall Length	Maximum Overall Width	Maximum Depth (Fixed Handguides)
(1)	(2)	(3)	(4)
3 000	3 650	650	1 250
4 000	4 650	650	1 250
5 000	5 650	650	1 250
7 000	7 650	650	1 300
9 000	9 650	650	1 300

TABLE 5 NOMINAL SIZES AND STOWAGE DIMENSIONS OF TYPE C (HINGED OR PORTABLE HANDGUIDES)

[*Clauses* 5.1 *and* 13.1(c)]

Nominal Size, mm	Maximum Stowage Dimensions in mm of Uncrated Gangways with Hinged or Portable Handguides		
	Maximum Overall Length	Maximum Overall Width	Maximum Depth (Stanchions Removed or Folded Flat)
(1)	(2)	(3)	(4)
3 000	3 650	650	470
4 000	4 650	650	470
5 000	5 650	650	473
7 000	7 650	650	495
9 000	9 650	650	500

APPENDIX B

(*Clause* 8.2)

METHOD OF TEST FOR INITIAL SAG AND DEFLECTION OF GANGWAYS

B-1. Initial sag shall be determined by placing the gangway horizontally on supports positioned according to the nominal size. The gangway is fully assembled with all fittings comprising the dead load. Stretch a thin string or wire tightly between the two support points and measure the maximum vertical distance Y appearing between the horizontal line and the base of the gangway. The procedure is adopted for both side stringers and the average of the two readings is taken as

$$\text{Initial sag} = \frac{Y_1 + Y_2}{2}$$

B-2. The deflection test shall be carried out immediately after the results of initial sag are determined. Apply, without shock, a uniform load equivalent to 4 000 N/m² to the longitudinal centre line of the decking. The load should be arranged from a selection of convenient sized sandbags or other material which will not damage the gangways and located at intervals of not more than 1 000 mm. Where the design incorporates individual decking plates a load equivalent to 4 000 N/m² shall be applied to each plate. The test load is applied for 15 minutes before the deflection movement of the gangway is measured.

The maximum movement of each side stringer X is measured between the string or wire stretched tightly between the support points and the base of the gangway as follows:

$$\frac{X_1 + X_2}{2}$$

Calculate the deflection as follows:

$$\frac{X_1 + X_2}{2} - \frac{Y_1 + Y_2}{2}$$

The maximum deflection shall not exceed the limit of nominal size divided by 75.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	st

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2